

## REPORT ON OIL ENGINE MACHINERY.

No. 225/

JUL -9 1937

Received at London Office

Date of writing Report 3rd June 1937 When handed in at Local Office 3rd June 1937 Port of NAGASAKI.

No. in Survey held at NAGASAKI. Date, First Survey 4th June 1936 Last Survey 14th May 1937  
Reg. Book. Number of Visits 14688997 on the ~~Ship~~ <sup>Single</sup> ~~Motor~~ <sup>Screw vessel</sup> "KOTOKU MARU". Tons Gross 6700.79  
Net 4859.91

Built at Nagasaki By whom built Mitsubishi Jukogyo K.K. Yard No. 671 When built 1937

Engines made at Nagasaki By whom made Mitsubishi Jukogyo K.K. Engine No. 671 When made 1937

Donkey Boilers made at Nagasaki By whom made Mitsubishi Jukogyo K.K. Boiler No. 671 When made 1937

Brake Horse Power 4000 Owners Hiroumi Shoji Kabushiki Kaisha Port belonging to Osaka

Nom. Horse Power as per Rule 839 Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

Trade for which vessel is intended All seas. 28 5/16" 149 3/16"

OIL ENGINES, &amp;c. Type of Engines Mitsubishi Airless Injection. 2 or 4 stroke cycle 2 Single or double acting Single

Maximum pressure in cylinders 45 Kg. Diameter of cylinders 720 m/m Length of stroke 1250 m/m No. of cylinders 6 No. of cranks 6

Mean Indicated Pressure 5.6 Kg. Span of bearings, adjacent to the Crank, measured from inner edge to inner edge 960 m/m Is there a bearing between each crank Yes

Revolutions per minute 125 Flywheel dia. 2200 m/m Weight 5000 Kg Means of ignition Compression Kind of fuel used Diesel Oil.

Crank Shaft, dia. of journals as per Rule 439.3 m/m as fitted 480 m/m Crank pin dia. 480 m/m Crank Webs Mid. length breadth 780 m/m Mid. length thickness 204 m/m Thickness parallel to axis 305 m/m Thickness around eyehole 217.5 m/m

Flywheel Shaft, diameter as per Rule 439.3 m/m as fitted 480 m/m Intermediate Shafts, diameter as per Rule 327.52 m/m as fitted 340 m/m Thrust Shaft, diameter at collars as per Rule 343.8 m/m as fitted 480 m/m

Tube Shaft, diameter as per Rule / as fitted / Screw Shaft, diameter as per Rule 360.33 m/m as fitted 415 m/m Is the shaft fitted with a continuous liner Yes

Bronze Liners, thickness in way of bushes as per Rule 18.6 m/m as fitted 23 m/m Thickness between bushes as per rule 13.96 m/m as fitted 17 m/m Is the after end of the liner made watertight in the

propeller boss Yes If the liner is in more than one length are the junctions made by fusion through the whole thickness of the liner Continuous

If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive Yes

If two liners are fitted, is the shaft lapped or protected between the liners / Is an approved Oil Gland or other appliance fitted at the after end of the tube

shaft / If so, state type / Length of Bearing in Stern Bush next to and supporting propeller 1670 m/m

Propeller, dia. 15'-6" Pitch 11.4' No. of blades 4 Material Bronze whether Moveable Moveable Total Developed Surface 7.08 M<sup>2</sup> sq. feet

Method of reversing Engines Direct Is a governor or other arrangement fitted to prevent racing of the engine when declutched Yes Means of lubrication

Forced. Thickness of cylinder liners 56 m/m at top Are the cylinders fitted with safety valves Yes Are the exhaust pipes and silencers water cooled or lagged with

non-conducting material Lagged If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine /

Cooling Water Pumps, No. Two Rotary Is the sea suction provided with an efficient strainer which can be cleared within the vessel Yes

Bilge Pumps worked from the Main Engines, No. / Diameter / Stroke / Can one be overhauled while the other is at work /

Pumps connected to the Main Bilge Line No. and Size 3 Reciprocating:- 1 off 200 tons/hr. 1 off 50 tons/hr. 1 off 55-110 tons/hr. How driven Elect. Motor.

Is the cooling water led to the bilges No. closed system. If so, state what special arrangements are made to deal with this water in addition to the ordinary bilge pumping arrangements /

Ballast Pumps, No. and size 1 off 100 to 200 T/hr. Power Driven Lubricating Oil Pumps, including Spare Pump, No. and size 2 off 30 Cub. M/hr.

Are two independent means arranged for circulating water through the Oil Cooler Yes Suctions, connected to both Main Bilge Pumps and Auxiliary Bilge

Pumps, No. and size:- In Machinery Spaces 4 off 90 m/m Dia. 2 off 50 m/m Dia. 2 off 50 m/m Dia. In Pump Room /

In Holds, &amp;c. 2 off in each Hold 3" Dia (1-P &amp; 1-S) total 10 off in holds &amp; 1 off in tunnel well 2 1/2" Dia.

Independent Power Pump Direct Suctions to the Engine Room Bilges, No. and size 1 off 200 m/m dia. &amp; 2 off 130 m/m dia.

Are all the Bilge Suction pipes in Holds and Tunnel Well fitted with strum-boxes Yes Are the Bilge Suctions in the Machinery Spaces

led from easily accessible mud-boxes, placed above the level of the working floor, with straight tail pipes to the bilges Yes

Are all Sea Connections fitted direct on the skin of the ship Yes Are they fitted with Valves or Cocks Both

Are they fixed sufficiently high on the ship's side to be seen without lifting the platform plates Yes Are the Overboard Discharges above or below the deep water line Above

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel Yes Are the Blow Off Cocks fitted with a spigot and brass covering plate Yes

What pipes pass through the bunkers / How are they protected /

What pipes pass through the deep tanks / Have they been tested as per Rule /

Are all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times Yes

Is the arrangement of valves and their connections such as to prevent the possibility of water passing from the sea or from water tanks into the cargo or machinery spaces, or from one

compartment to another Yes Is the Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from on Upper dk

If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork /

Main Air Compressors, No. Two. (Kobe Cert. No. 5994) No. of stages 3 Diameters 70 x 270 x 310 m Stroke 180 mm Driven by Aux. engine

Auxiliary Air Compressors, No. One. (Kobe Cert. No. 5524) No. of stages 2 Diameters 30 x 88 m Stroke 90 mm Driven by Hot bulb. eng.

Small Auxiliary Air Compressors, No. / No. of stages / Diameters / Stroke / Driven by /

Scavenging Air Pumps, No. 6 Diameter 600 m/m Stroke 1250 m/m Driven by Main engine

Auxiliary Engines crank shafts, diameter as per Rule See Kobe Rpt. 138 m/m as fitted 155 m/m No. 3 Position Eng. room.

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**AIR RECEIVERS:**—Is each receiver, which can be isolated, fitted with a safety valve as per Rule. **Yes**

Can the internal surfaces of the receivers be examined and cleaned **Yes** Is a drain fitted at the lowest part of each receiver **Yes**

**High Pressure Air Receivers, No.** / **Cubic capacity of each** / **Internal diameter** / **thickness** /

Seamless, lap welded or riveted longitudinal joint / **Material** / **Range of tensile strength** / **Working pressure** by Rules / **Actual** /

**Starting Air Receivers, No.** **Two** **Total cubic capacity** **8.6 M<sup>3</sup> each.** **Internal diameter** **1600 m/m** **thickness** **40 m/m**

Seamless, lap welded or riveted longitudinal joint **T.R.D.B.S** **Material** **Steel** **Range of tensile strength** **44-55 Kgs/cm<sup>2</sup>** **Working pressure** by Rules **46.8 Kg/cm<sup>2</sup>** **Actual** **45.0**

**IS A DONKEY BOILER FITTED?** **Yes** If so, is a report now forwarded? **Yes**

Is the donkey boiler intended to be used for domestic purposes only **No.** **Used for room heaters, tank heating coils &c.**

**PLANS.** Are approved plans forwarded herewith for Shafting **5-6-36 & 6-7-36** **Receivers** **5-5-36** **Separate Fuel Tanks** **2-10-36**  
(If not, state date of approval)

**Donkey Boilers** **27-8-36** **General Pumping Arrangements** **12-9-36** **Pumping Arrangements in Machinery Space** **12-9-37**

**Oil Fuel Burning Arrangements** /

### SPARE GEAR.

Has the spare gear required by the Rules been supplied **Yes**

State the principal additional spare gear supplied **See separate list, forwarded under separate cover.**

The foregoing is a correct description,

**NAGASAKI WORKS, LTD.** **KATSUMI KAISHA.**

**GENERAL MANAGER**

Manufacturer.

**Dates of Survey while building**  
During progress of work in shops-- **1936: June 4.5.12.18.23.24.29.30 July 1.4.10.13.20.22.27.29 Aug 1.4.6.7.11.12.13.14.17.18.20.21.24.26.27.28.31 Sep 1.2.3.4.5.7.8.10.11.12.14.18.19.22.26.28 Oct 1.5.6.12.13.14.15.16.19.20.22.24.26.27.29 Nov 2.4.5.6.9.11.12.13.14.16.19.21.24 Dec 2.3.4.7.8.9.12.14.16.18.21.22.23.24.26.29.30: 1937, Jan 6.8.9.12.14.15.16.18.20.21.22.25.26.27.30 Feb 2.5.6.9.13.16.17.19.20.23 Mar 1.2.3.4.9.11.15.15.23 Apr 5.12.13.14.16.17.20.21.26.28 May 1.6.7.8.11.14.**  
During erection on board vessel--  
Total No. of visits **146.**

**Dates of Examination of principal parts—Cylinders** **14-10-36** **Covers** **16-10-36** **Pistons** / **Rods** **31-8-36** **Connecting rods** **25-7-37** **15-10-36**

**Crank shaft** **26-9-36** **Flywheel shaft** **6-10-36** **Thrust shaft** **6-10-36** **Intermediate shafts** **8-1-37** **Tube shaft** /

**Screw shaft** **21-1-37** **Propeller** **12-1-37** **Stern tube** **20-1-37** **Engine seatings** / **Engines holding down bolts** **16-2-37**

**Completion of fitting sea connections** **28-1-37** **Completion of pumping arrangements** **20-4-37** **Engines tried under working conditions** **26-4-37**

**Crank shaft, Material** **Ingot steel** **Identification Mark** **LR No. 1469 & 1469-A.** **Flywheel shaft, Material** **Ingot steel** **Identification Mark** **LR No. 1481.**

**Thrust shaft, Material** **Ingot steel** **Identification Mark** **See Flywheel shaft** **Intermediate shafts, Material** **Ingot steel** **Identification Marks** **LR No. 1598.**

**Tube shaft, Material** / **Identification Mark** / **Screw shaft, Material** **Ingot steel** **Identification Mark** **LR No. 1614.**

Is the flash point of the oil to be used over 150° F. **Yes**

Have the requirements of the Rules for oil fuel pipes and tank fittings been complied with **Yes**

Is the vessel (not being an oil tanker) fitted for carrying oil as cargo **Yes** If so, have the requirements of the Rules been complied with **Yes**

If the notation for Ice Strengthening is desired, state whether the requirements in this respect have been complied with /

Is this machinery duplicate of a previous case / If so, state name of vessel /

**General Remarks** (State quality of workmanship, opinions as to class, &c.)

**This machinery has been constructed under Special survey in accordance with the Rules & Approved plans.**

**The materials have been tested, found efficient and the workmanship throughout is good.**

**Full load, overload and governor tests carried out on test bed connected to Dynamometer with satisfactory results, afterwards all parts opened up examined and found good.**

**The machinery was afterwards efficiently installed on board, tested under full working conditions, manoeuvring (12 stops & starts), slow speed (38-40 R.p.m), and full astern, with satisfactory results.**

**A mean speed on trial of 16.22 knots was obtained on light draught at 135 r.p.m.**

**This case is eligible in our opinion to have the record of **LMC, 5-37** in the Register Book.**

The amount of Entry Fee £ **6-0-0** : When applied for, :  
Special ... £ **146-3-9** : **20. 5** 19 **37** :  
Donkey Boiler Fee ... £ : :  
**Air receivers** ... £ **10-10-0** : When received, :  
Travelling Expenses (if any) £ : **10. 6** 19 **37** :

**Committee's Minute**

**Assigned + Lmc 5.37** **LB 12/16**

**H. Buchanan** **T. T. Kumishu**  
Engineer Surveyor to Lloyd's Register of Shipping.



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Foundation